Vote Item: Is "Compassionate Software Development" a Topic Worth Researching?

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ABSTRACT

Background: Prior research indicates that software developers experience serious levels of anxiety and stress, a form of suffering, due to a highly time-bound and technology-focused job environment. Such suffering affects their emotional well-being, professional productivity, and the software products they develop.

Information, Idea, Arguments: Compassion arises when a person is confronted with another human's suffering and feels motivated to relieve that suffering. We want to explore how increasing compassion in software developers can positively impact the software development process.

Vote: Is "compassionate software development" a topic worth researching?

CCS CONCEPTS

• Software and its engineering → Software creation and management

KEYWORDS

Human factors, Compassion, Anxiety, Stress, Burnout, Software process improvement

1 Background

Software is built by, with, and for human beings. Researchers and practitioners have started to recognize the importance of understanding the impact of emotions and feelings in developing software [4,14]. For instance, a study found that emotions might act as a proxy for job satisfaction and productivity in software projects [4], while another study identified stress and burnout owing to toxicity in open source communities [12]. Although compassion is recognized as important across many sectors of society [10], there is scarce research addressing the role of compassion in software engineering (SE) [14]. However, a growing number of software practitioners believe that skills that cultivate compassionate states, attitudes, or behaviors are necessary to build effective development teams [3,7,16].

2 Information, Idea, Arguments

Our research team has more than 60 years of accumulated experience in the software industry and SE research. We have studied the role of human factors in SE and realized that developers' emotions and feelings affect software process. This fact led us to review, in the first instance, published studies about the effect of empathy in the SE context. For example, one study found that collective empathy affects team learning and product speed-to-market while lowering software development costs [1]. Other studies indicate that DevOps approaches foster empathy within and between the development and operation teams in software development organizations, e.g. [13,17]. Practitioners are also discussing the role of empathy in software development [5,6].

After reviewing the literature on empathy, the term "empathic compassion" called our attention to compassion. We analyzed this concept in its broadest context [2,10,15] and also found two practitioner approaches on compassionate software and compassionate coding [3,16]. The main reasons behind focusing on compassion are that (i) definitions of compassion consider empathy a critical precursor to compassion [2,15], and (ii) compassion triggers positive effects like affiliation while increasing social connectivity [2,10,15]. The latter is crucial to minimize the resignation of team members during software development projects. Therefore, we posit that compassionate

software development can be achieved when developers act with compassion towards fellow human beings.

A specific form of compassion, called distal compassion, involves recognizing the problem that lies ahead and having the willingness to engage in actions to prevent that upcoming suffering, even if it requires some immediate sacrifices from the compassionate person [2]. The exercise of distal compassion by developers during a software project [3,16] might entail taking actions to minimize teammates´ suffering when performing technical activities, such as specifying software requirements, writing cleaner code with proper documentation, designing test cases, or showing patience and understanding when a peer falters during designing, coding, testing, deploying, operating, or maintaining a software product.

In daily work interactions, software developers can find opportunities for the application of compassion throughout the entire software process. Any software practitioner has experienced suffering while troubleshooting mysterious errors, arguing with teammates, redoing work due to miscommunication, or dealing with poorly commented legacy code. Moreover, disparaging comments in technical reviews can have a negative effect on software developers, and they can also sometimes be very harsh in shaming someone who asks a question on a forum. If compassion is present in the work environment, it is expected that developers' stress and anxiety levels will decrease. Likewise, it is also expected that developers' productivity and retention in software projects will increase. In this sense, emerging research in other contexts has suggested that compassionate mind training enhances well-being, improves levels of compassion, and reduces self-criticism [8,9]. In challenging times, such as the COVID-19 pandemic [11], being compassionate at work might be more important than ever.

To sum up, it would be worthwhile to research the effects of having different levels of compassion in the development process and provide recommendations to improve it, e.g., by implementing a compassionate approach to technical reviews or pair programming. It suggests a human-centered study that considers not only the developers' mindset but also organizational culture, including other stakeholders that are involved in the process, i.e., the whole ecosystem which imposes several challenges to overcome. To the best of our knowledge, there is no previous SE research focused on this topic.

3   Vote

Is "compassionate software development" a topic worth researching?

• Yes, because compassion might have a positive effect on the software development process.

• Yes, because a set of pragmatic practices based on compassion for performing software development activities might increase the productivity of the team.

• Yes, because in their quest to free fellow developers from suffering, developers would produce better quality software products.

• No, because developing empathy is enough in the software development context.

• No, because there is no relationship between compassion and software development.

• No, for some other reason that I can further explain to authors.

REFERENCES

[1]   Ali E. Akgün, Halit Keskin, A. Yavuz Cebecioglu, and Derya Dogan. 2015. Antecedents and consequences of collective empathy in software development project teams. *Information & Management* 52, 2 (March 2015), 247–259. DOI:https://doi.org/10.1016/j.im.2014.11.004

[2]   Paul Ekman and Eve Ekman. 2017. Is Global Compassion Achievable? In *The Oxford Handbook of Compassion Science*, Emma M. Seppälä, Emiliana Simon-Thomas, Stephanie L. Brown, Monica C. Worline, C. Daryl Cameron and James R. Doty (eds.). New York, NY, 41–49. DOI:https://doi.org/10.1093/oxfordhb/9780190464684.013.4

[3]   Ash Furrow. Building Compassionate Software. Retrieved January 15, 2022 from https://ashfurrow.com/blog/building-compassionate-software/

[4]   Daniela Girardi, Filippo Lanubile, Nicole Novielli, and Alexander Serebrenik. 2021. Emotions and Perceived Productivity of Software Developers at the Workplace. *IEEE Transactions on Software Engineering* (2021), 1–1. DOI:https://doi.org/10.1109/TSE.2021.3087906

[5]   Andrea Goulet. Empathy-Driven Development (EmDD). *Empathy-Driven Development (EmDD)*. Retrieved from https://www.empathy-driven-development.com/

[6]   Andrea Goulet. Empathy is a Technical Skill. *InfoQ*. Retrieved from https://www.infoq.com/articles/empathy-technical-skill/

[7]   Bridget Kromhout. 2017. Containers Will Not Fix Your Broken Culture (and Other Hard Truths). *Queue* 15, 6 (December 2017), 50:46-50:56. DOI:https://doi.org/10.1145/3178368.3185224

[8]   J. Leaviss and L. Uttley. 2015. Psychotherapeutic benefits of compassion-focused therapy: an early systematic review. *Psychol Med* 45, 5 (April 2015), 927–945. DOI:https://doi.org/10.1017/S0033291714002141

[9]   Marcela Matos, Cristiana Duarte, Joana Duarte, José Pinto-Gouveia, Nicola Petrocchi, and Paul Gilbert. 2021. Cultivating the Compassionate Self: an Exploration of the Mechanisms of Change in Compassionate Mind Training. *Mindfulness* (October 2021). DOI:https://doi.org/10.1007/s12671-021-01717-2

[10] Dorian Peters and Rafael Calvo. 2014. Compassion vs. empathy: designing for resilience. *interactions* 21, 5 (September 2014), 48–53. DOI:https://doi.org/10.1145/2647087

[11] Paul Ralph, Sebastian Baltes, Gianisa Adisaputri, Richard Torkar, Vladimir Kovalenko, Marcos Kalinowski, Nicole Novielli, Shin Yoo, Xavier Devroey, Xin Tan, Minghui Zhou, Burak Turhan, Rashina Hoda, Hideaki Hata, Gregorio Robles, Amin Milani Fard, and Rana Alkadhi. 2020. Pandemic programming. *Empir Software Eng* 25, 6 (November 2020), 4927–4961. DOI:https://doi.org/10.1007/s10664-020-09875-y

[12] Naveen Raman, Minxuan Cao, Yulia Tsvetkov, Christian Kästner, and Bogdan Vasilescu. 2020. Stress and burnout in open source: toward finding, understanding, and mitigating unhealthy interactions. In *Proceedings of the ACM/IEEE 42nd International Conference on Software Engineering: New Ideas and Emerging Results* (ICSE-NIER '20), Association for Computing Machinery, New York, NY, USA, 57–60. DOI:https://doi.org/10.1145/3377816.3381732

[13] Mary Sánchez-Gordón and Ricardo Colomo-Palacios. 2018. Characterizing DevOps Culture: A Systematic Literature Review. In *Software Process Improvement and Capability Determination* (Communications in Computer and Information Science), Springer International Publishing, Cham, 3–15. DOI:https://doi.org/10.1007/978-3-030-00623-5_1

[14] Mary Sánchez-Gordón and Ricardo Colomo-Palacios. 2019. Taking the emotional pulse of software engineering — A systematic literature review of empirical studies. *Information and Software Technology* 115, (November 2019), 23–43. DOI:https://doi.org/10.1016/j.infsof.2019.08.002

[15] Clara Strauss, Billie Lever Taylor, Jenny Gu, Willem Kuyken, Ruth Baer, Fergal Jones, and Kate Cavanagh. 2016. What is compassion and how can we measure it? A review of definitions and measures. *Clinical Psychology Review* 47, (July 2016), 15–27. DOI:https://doi.org/10.1016/j.cpr.2016.05.004

[16] April Wensel. Compassionate Coding. *Compassionate Coding*. Retrieved January 15, 2022 from https://compassionatecoding.com

[17] Anna Wiedemann, Nicole Forsgren, Manuel Wiesche, Heiko Gewald, and Helmut Krcmar. 2019. Research for practice: the DevOps phenomenon. *Commun. ACM* 62, 8 (July 2019), 44–49. DOI:https://doi.org/10.1145/3331138